12 INTERPRETATION

12.1 GOALS:

12.1.1 To develop a working knowledge of the FMBIO software used for the analysis of the scanned images.

12.1.2 To become familiar with the visual interpretation of the typing gel.

12.1.3 To become familiar with the base pair size range of the different PowerPlex® 16 BIO loci.

12.1.4 To understand the use of controls and the internal lane standard.

12.1.5 To understand the problems that may be encountered with regard to interpretation.

12.1.6 To become familiar with the proper documentation of the results.

12.2 TASKS:

12.2.1 Analyze the scanned images using the FMBIO software. Refer to the Commonwealth of Virginia Department of Forensic Science Forensic Biology Section Manual, Section III - Fluorescent Detection PCR-Based STR DNA Protocol: PowerPlex® 16 BIO System for the procedure.

12.2.2 Compare visual interpretations of the results from the typing gels with the interpretations of the results using the STaRCall software.

12.2.3 Interpret all results successfully and properly document the results.

12.2.4 Read applicable literature and become familiar with glossary terms. Refer to Appendices A, B, and C.

12.3 TRAINING EVALUATION:

12.3.1 Knowledge

12.3.1.1 Review of notes, copies of all original gel scans, gray scale/color-corrected images, and copies of allele calls generated by the STaRCall software program (including the landscape printout) in the training notebook by the training coordinator.

12.3.1.2 Mini-mock trials and/or question and answer sessions.

12.3.2 Skills

12.3.2.1 The trainee should demonstrate a thorough understanding of all aspects of the typing gel interpretation by accurately interpreting PowerPlex® 16 BIO results on all training samples and properly recording results. This will be monitored by review of the documentation in the training notebook and continual observation by the training coordinator.

12.3.3 Completion of the trainee checklist by the training coordinator.

STUDY QUESTIONS:

1. What are the PowerPlex® 16 BIO loci and on which chromosomes are they located?

2. The allelic ladder used to interpret the results at the PowerPlex® 16 BIO loci consists of how many alleles?

3. The internal lane standard consists of how many bands? What is the base pair size of each band?

4. What is meant by a heteroduplex?

5. What is a stutter band? How is a stutter band differentiated from a true allele?

6. What is a non-template nucleotide addition?

7. What is allele/locus dropout and what can cause this to occur?

8. What is the genotype of the GM9947A cell line at each locus?

9. What is a microvariant? How does this differ from an off-ladder variant?

10. What is the base pair size range for each locus?

11. Some phenotypic XY males possess a deletion in the Y chromosome, resulting in the loss of AMELY sequence.

    a. What is the estimated frequency of this deletion polymorphism?

    b. What is the possible cause of this deletion polymorphism?

12. What is the purpose of the Matrix 16 BIO?

13. Please explain what a complex repeat unit means. Which of the PowerPlex® 16 BIO loci are considered to have a complex repeat unit?

CHECKLIST FOR INTERPRETATION

Name of Trainee: _____

1. Trainee has demonstrated his/her ability to visually interpret the scanned images generated by the FMBIO Fluorescent Image Analysis System.

   Date:_____ Training Coordinator:_____

   Comments:_____

2. Trainee has a clear understanding of the purpose of each of the controls and how each affects the interpretation of the results.

   Date:_____ Training Coordinator:_____

   Comments:_____

3. Trainee has demonstrated his/her ability to interpret the results generated by the STaRCall software.

   Date:_____ Training Coordinator:_____

   Comments:_____

4. Trainee has successfully completed the typing and interpretation of all training samples specified in Chapter 4, DNA Isolation, including proper documentation of the interpretation.

   Date:_____ Training Coordinator:_____

   Comments:_____

5. Notebook is organized and complete.

   Date:_____ Training Coordinator:_____

   Comments:_____

6. Trainee has participated in mini-mock trials and/or question and answer sessions.

   Date:_____ Training Coordinator:_____

   Comments:_____

♦END